

AMENDMENTS TO THE CLAIMS

1-23. (Cancelled)

24. (Currently Amended) A method for the deposition of a thin film of a pre-determined composition onto a substrate, said composition comprising a ternary, quaternary or higher composition, comprising:

- (i) placing a first deposit at a first source of a vapour deposition apparatus and placing a second deposit at a second source of the vapour deposition apparatus, said first and second deposits being different, components of said first and second deposits in combination forming said pre-determined composition;
- (ii) placing first and second coating rate monitors ~~closer to said substrate than~~ spaced from said first and second sources, said first coating rate monitor being shielded from deposition from the second source but open to deposition from the first source and said second coating rate monitor being shielded from deposition from the first source but open to deposition from the second source;
- (iii) ~~simultaneously effecting vapour~~ constant deposition of said components onto the substrate and the first and second coating rate monitors by simultaneously sputtering ~~of said components from said first and second deposits onto the substrate and the first and second coating rate monitors;~~
- (iv) independently measuring rates of deposition of said components onto said first and second coating rate monitors,
- (v) determining temporal variation of the deposition of said components based on the independently measured rates of deposition; and
- (vi) controlling stoichiometry of said ~~vaporized-sputtered~~ components using said temporal variation of the deposition of said components as feedback to ~~ensure~~ provide constant deposition on said substrate and said first and

second coating rate monitors, thereby obtaining a continuous homogeneous temporal deposition of said composition on said substrate.

25. (Previously Presented) The method of Claim 24 wherein each of the first and second coating rate monitors includes one crystal rate monitor.

26. (Previously Presented) The method of Claim 25 wherein controlling stoichiometry of said vaporized components includes controlling temperatures of the first and second sources.

27. (Cancelled)

28. (Previously Presented) The method of Claim 24 in which said composition is a thin film phosphor.

29. (Previously Presented) The method of Claim 28 in which said composition is selected from the group consisting of thioaluminates, thiogallates and thioindates of at least one cation from Groups IIA and IIB of the Periodic Table.

30. (Previously Presented) The method of Claim 24 in which the composition is a dielectric thin film.

31. (Previously Presented) The method of Claim 30 in which there is the additional step of depositing a phosphor juxtaposed to said dielectric film.

32. (Previously Presented) The method of Claim 24 in which the first and second deposits are sulphides.

33. (Previously Presented) The method of Claim 24 in which a third deposit is placed at a third source, components of said third deposit forming part of said composition.

34. (Previously Presented) The method of Claim 24 in which said substrate is opaque in the visible and infrared regions of the electromagnetic spectrum.

35. (Previously Presented) The method of Claim 24 in which said composition is of the formula $Ba_aCa_{1-a}Al_2S_4:Eu$, where "a" is the range of 0 to 1.

36. (Previously Presented) The method of Claim 29 in which the cation is selected from the group consisting of barium, calcium, strontium, magnesium, zinc and cadmium, and mixtures thereof.

37. (Cancelled)

38. (Currently Amended) The method of Claim ~~37~~29 in which the composition is a dielectric thin film.

39. (Previously Presented) The method of Claim 38 in which vapour deposition is by electron beam.

40. (Previously Presented) The method of Claim 39 in which temperature of said first and second sources is controlled.

41. (Previously Presented) The method of Claim 24 in which vapour deposition is by thermal evaporation.

42. (Previously Presented) The method of Claim 41 in which temperature of said first and second sources is controlled.

43. (Previously Presented) The method of Claim 39 in which said composition is of the formula $Ba_aCa_{1-a}Al_2S_4:Eu$, where "a" is the range of 0 to 1.

44. (Previously Presented) The method of Claim 39 in which the composition is $CaAl_2S_4:Eu$.

45. (Cancelled).

46. (Currently Amended) A method for the deposition of a thin film of a pre-determined composition onto a substrate, said composition comprising a ternary, quaternary or higher composition, comprising:

placing a first deposit at a first source of a vapour deposition apparatus and placing a second deposit at a second source of the vapour deposition apparatus, said first and second deposits being different, components of said first and second deposits in combination forming said pre-determined composition;

placing first and second crystal rate monitors proximate to said substrate, said first crystal rate monitor being shielded from deposition from the second source but open to deposition from the first source and said second crystal rate monitor being shielded from deposition from the first source but open to deposition from the second source;

simultaneously effecting constant vapour deposition of said components ~~from-by~~ simultaneously sputtering said first and second deposits onto the substrate and the first and second crystal rate monitors;

independently measuring rates of deposition of said components onto said first and second crystal rate monitors; and

forming a homogeneous layer of said composition on the substrate by controlling stoichiometry of said vaporized components using the independently measured rates of deposition of said components onto the first and second crystal rate monitors as feedback.